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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,750	07/01/2003	Toshihisa Yamamoto	450100-4681.5	5021

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EXAMINER	
HANNETT, JAMES M	
ART UNIT	PAPER NUMBER
2622	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/611,750	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	James M. Hannett	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/1/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/1/2003 has been considered by the examiner.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Interpolation process for an image processing apparatus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1: Claims 19, 21, 22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,555,023 Maenaka et al.

2: As for Claim 19, Maenaka et al depicts in Figures (1 and 2) and teachers on Column 2, Lines (1-18 and 58-67) on Column 4, Lines 1-10 and on Column 5, Lines 9-30 a camera signal processing apparatus comprising: an interpolated pixel data generating means (16-21) for interpolating pixel data in at least two directions based on a position of the pixel data and/or pixel data around said position, the pixel data being generated based on an imaging signal coming from a solid-state image sensor (2) in which an imaging light enters through a color filter having a different spectral characteristic for each pixel (Figure 5),thereby separately generating interpolated pixel data in said at least two directions. Maenaka et al teaches a correlation detecting means (26) for detecting a correlation value (Sh1 and Sv1) indicative of a degree of correlation in each of said at least two directions (horizontal and vertical directions) of the interpolated pixel data (L0, L1,L2) generated by the interpolated pixel data generating means (16-21). Maenaka et al teaches on Column 4, Lines 20-30 and Column 5, Lines 25-45 and depicts in Figure 1 a noise canceling means (27) for subtracting a predetermined value from the correlation value (Sh1 and Sv1) detected by the correlation value detecting means (26). Maenaka et al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by calculating equation (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. Maenaka et al teaches a weighting means (28 and 29) for weighting the interpolated pixel data (L0,L1,L2) in each of said at least two directions (Horizontal and Vertical) generated by the interpolated pixel data generating means (16-21) with the correlation value (Sh1 and Sv1) detected by the correlation detecting means (26) in each of the at least two directions and adding together (24) the weighted interpolated pixel data (output of 28 and 29) in all of the at least two

directions to generate interpolated pixel data (output of 25). Maenaka et al teaches an image generating means (25) for generating an image (output of 25) based on the interpolated pixel data (L0,L1,L2) generated by the interpolated pixel data generating means (16-21).

3: In regards to Claim 21, Maenaka et al teaches on Column 6, Lines 18-40 and on Column 5, Lines 25-46 the noise canceling means (27) comprises an absolute value converting means (see equations 7 and 8) for making absolute the inputted correlation value in each of the at least two directions (Horizontal and Vertical); a subtracting means (27) for subtracting a predetermined value from the correlation value made absolute by the absolute value converting means (Sh1 and Sv1) in each of the at least two directions (Horizontal and Vertical); Maenaka et al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by calculating equation (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. Furthermore, since the equations (7 and 8) are absolute values, the correlation values subtracted by the subtracting means in each of the at least two directions(Horizontal and Vertical) are limited to a positive number.

4: As for Claim 22, Maenaka et al depicts in Figures (1 and 2) and teachers on Column 2, Lines (1-18 and 58-67) on Column 4, Lines 1-10 and on Column 5, Lines 9-30 a camera signal processing apparatus comprising: an interpolated pixel data generating means (16-21) for interpolating pixel data in at least two directions based on a position of the pixel data and/or pixel data around said position, the pixel data being generated based on an imaging signal coming from a solid-state image sensor (2) in which an imaging light enters through a color filter having a different spectral characteristic for each pixel (Figure 5),thereby separately generating

interpolated pixel data in said at least two directions. Maenaka et al teaches a correlation detecting means (26) for detecting a correlation value (Sh1 and Sv1) indicative of a degree of correlation in each of said at least two directions (horizontal and vertical directions) of the interpolated pixel data (L0, L1,L2) generated by the interpolated pixel data generating means (16-21). Maenaka et al teaches on Column 4, Lines 20-30 and Column 5, Lines 25-45 and depicts in Figure 1 a noise canceling means (27) for subtracting a predetermined value from the correlation value (Sh1 and Sv1) detected by the correlation value detecting means (26). Maenaka et al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by calculating equation (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. Maenaka et al teaches a weighting means (28 and 29) for weighting the interpolated pixel data (L0,L1,L2) in each of said at least two directions (Horizontal and Vertical) with the subtracted correlation values (K1 and K2) in each of the at least two directions (Horizontal and Vertical). To generate interpolated pixel data obtained by adding together (24) the weighted interpolated pixel data (output of 28 and 29) in all of the at least two directions to generate interpolated pixel data (output of 25).

5: In regards to Claim 24, Maenaka et al teaches on Column 6, Lines 18-40 and on Column 5, Lines 25-46 the noise canceling means (27) comprises an absolute value converting means (see equations 7 and 8) for making absolute the inputted correlation value in each of the at least two directions (Horizontal and Vertical); a subtracting means (27) for subtracting a predetermined value from the correlation value made absolute by the absolute value converting means (Sh1 and Sv1) in each of the at least two directions (Horizontal and Vertical); Maenaka et

al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by equations (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. Furthermore, since the equations (7 and 8) are absolute values, the correlation values subtracted by the subtracting means in each of the at least two directions (Horizontal and Vertical) are limited to a positive number.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6: Claims 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,555,023 Maenaka et al.

7: As for Claim 20, Maenaka et al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by equations (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. However, Maenaka et al performs the subtraction process by using a ratio equation that divides the correlation value by the sum of the correlation values in both the horizontal and vertical directions) and does not teach that the subtraction can be performed based on an inputted subtrahend.

Official Notice is taken that it was well known in the art at the time the invention was made that performing division calculations in computers was very costly and required significant

computing power and that it was common at the time to replace the division calculations with an algorithm that utilizes addition and subtraction operations that is equivalent to division however is rewritten in order to reduce the computing needs of the computer and therefore, reduce system complexity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the ratio (division calculation) of Maenaka et al in the computer system of Maenaka et al using an algorithm that performed division using an equation that utilized a subtrahend in order to reduce the computing needs of the computer and therefore, reduce system complexity.

8: In regards to Claim 23, Maenaka et al teaches that the values (Sh1 and Sv1) are reduced to K1 and K2 in order to prevent false signals from being generated (reduce noise). This process is performed by equations (5 and 6). Since these equations always reduce the value of (Sh1 and Sv1) it is viewed as a subtraction. However, Maenaka et al performs the subtraction process by using a ratio equation that divides the correlation value by the sum of the correlation values in both the horizontal and vertical directions) and does not teach that the subtraction can be performed based on an inputted subtrahend.

Official Notice is taken that it was well known in the art at the time the invention was made that performing division calculations in computers was very costly and required significant computing power and that it was common at the time to replace the division calculations with an algorithm that utilizes addition and subtraction operations that is equivalent to division however is rewritten in order to reduce the computing needs of the computer and therefore, reduce system complexity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the ratio (division calculation) of Maenaka et al in the computer system of Maenaka et al using an algorithm that performed division using an equation that utilized a subtrahend in order to reduce the computing needs of the computer and therefore, reduce system complexity.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2003/0133034 A1 Takahashi teaches the use of a camera system performing image processing; USPN 5,734,424 Sasaki teaches the use of an image processing apparatus using a weighted interpolation method; USPN 6,018,363 Horii teaches a signal processing method as depicted in Figure 4.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Hannett whose telephone number is 571-272-7309. The examiner can normally be reached on 8:00 am to 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James M. Hannett
Examiner
Art Unit 2622

JMH
March 8, 2007

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